

Remarks

Examiner Ni is thanked for the thorough Office Action.

In the Drawings

The Examiner is requested to approve the changes to the substitute drawing sheet 1/1, specifically to Fig. 3 wherein film "22" has been changed to film -- 32 -- for clarity.

In the Specification

Paragraph 2 on page 9 and paragraphs 2 and 3 on pages 11 and 12 have been amended to correspond to the change to Fig. 3 of the drawings, i.e. film "22" is now film -- 32 --.

In the Claims

The Claims have not been further amended.

Claim Rejections

The Rejection Of Claims 1, 2, 8 To 11, 17 To 20 And 26 To 31 Under 35 U.S.C. §103(a) as Being Unpatentable Over Perng et al. (U.S. Patent No. 6,149,987) In View Of Ngo (U.S. Patent No. 6,054,735)

The rejection of claims 1, 2, 8 to 11, 17 to 20 and 26 to 31 under 35 U.S.C. §103(a) as being unpatentable over Perng et al. (U.S. Patent No. 6,149,987) (the '987 Perng Patent) in view of Ngo (U.S. Patent No. 6,054,735) (the '735 Ngo Patent) is acknowledged.

The Rejection Of Claims 3 To 7, 12 To 16, 21 To 25 And 32 To 24 Under 35 U.S.C. §103(a) as Being Unpatentable Over Perng et al. (U.S. Patent No. 6,149,987) In View Of Ngo (U.S. Patent No. 6,054,735) As Applied To Claims 1, 2, 8 To 11, 17 To 20 And 26 To 31, And Further In View Of Tao (U.S. Patent No. 5,904,566)

The rejection of claims 3 to 7, 12 to 16 and 21 to 25 under 35 U.S.C. §103(a) as being unpatentable over Perng et al. (U.S. Patent No. 6,149,987) (the '987 Perng Patent) in view of Ngo (U.S. Patent No. 6,054,735) (the '735 Ngo Patent) as applied to claims 1, 2, 8 to 11, 17 to 20 and 26 to 31 above and further in view of Tao (U.S. Patent No. 5,904,566) (the '566 Tao Patent) is acknowledged.

Applicants have amended Fig. 3 of the drawings to clarify that reference number "22" now only in Fig. 2, with film "22" in Fig. 3 now changed to

-- 32-- are in reference to "the thermal CVD reactant gases will be attracted, as at 22 of Fig. 2, towards pre-coated inner walls 14 more than towards the surface of wafer 18 having upper film 32."

Applicants' wish to briefly point up the claimed features of their invention which are believed to be not shown nor obvious from the teachings of known references in this field. The claims all clearly define:

- (1) pre-coating the inner walls of a CVD chamber with a first PECVD silicon oxide film having a first thermal CVD oxide deposition rate;
- (2) placing a semiconductor wafer within the pre-coated CVD chamber, the wafer having an upper second PECVD silicon oxide film having a second thermal CVD oxide deposition rate that is less than the first thermal CVD oxide deposition rate of the first PECVD silicon oxide film coating the inner walls of the CVD chamber; and
- (3) depositing a porous silicon oxide film upon the semiconductor wafer's second PECVD silicon oxide film, the porous silicon oxide film being different from the first PECVD silicon oxide film coating the inner walls of the CVD chamber and such that the porous silicon oxide film is deposited upon the PECVD silicon oxide film coating the inner walls of the CVD chamber at a faster rate than upon the semiconductor wafer's second PECVD silicon oxide film.

Applicants maintain that the '735 Ngo Patent teaches away from the claimed instant invention as it discloses seasoning a chamber with a film material and then depositing the *same* film material on a wafer. While, arguendo, "Ngo gives motivation in col. 1, lines 31-33, which facilitates producing a high quality uniform and

very thin PECVD oxide layer”(Continuation Sheet to the 04/01/2003 Advisory Action. lines 17 and 18), such limitations are not claimed in the pending independent claims 1, 11, 20, 32, 33 and 34 in the instant application. Independent claim 1, for example, instead claims, inter alia, depositing a porous silicon oxide film upon the upper second PECVD silicon oxide film overlying the semiconductor wafer; *the porous silicon oxide film being different from the first PECVD silicon oxide film coating the CVD chamber inner walls.*” (emphasis added)

Applicants respectfully disagree with what the Examiner states the '987 Perng Patent teaches at Col. 10, lines 5 to 25. Perng discloses at this instance that *instead* of reducing or eliminating surface sensitivity “to improve the film quality and rate of deposition of the SACVD layer” (Col. 10, lines 9 to 11), Perng “*enhances* surface sensitivity...”. (emphasis added) Col. 10, lines 19 and 20.

Again, the "987 Perng Patent not only does not disclose a pre-coating step, for which the Examiner cites Ngo, the combination does not disclose or teach that the:

(1) second thermal CVD oxide deposition rate (*referring to the subsequently formed porous silicon oxide film*) upon the upper second PECVD silicon oxide film on the semiconductor wafer is less than the

(2) first thermal CVD oxide deposition rate (*referring to the subsequently formed porous silicon oxide film*) upon the first PECVD silicon oxide film on the CVD chamber walls.

Applicant has italicized and bolded sections of the above argument to emphasize one of the key patentable differences between the claimed instant invention and Perng. Again, the wording "layer of first PECVD silicon oxide film having a first thermal CVD oxide deposition rate" and the "upper second PECVD silicon oxide film having a second thermal CVD oxide deposition rate" from for example, Claim 1, lines 3 and 4 and lines 7 and 8, respectively, clearly define a second layer of PECVD silicon oxide film upon which *another layer* is deposited by a thermal CVD oxide process at a deposition rate that is less than the deposition rate of the *other layer* being deposited upon the first layer of PECVD silicon oxide film. None of the references cited by the Examiner disclose or teach such limitations.

To further differentiate over the cited combination, the porous silicon oxide film 20 deposited upon the semiconductor wafer's 18 second PECVD silicon oxide film 22 is different from the first PECVD silicon oxide film 16 pre-coated upon the inner walls 14 of the CVD chamber 10.

Thus, independent claims 1, 11, 20, 32, 33 and 34 distinguish over: (1) the '987 Perng Patent in view of the '735 Ngo Patent under §103(a); and (2) the '987 Perng Patent in view of the '735 Ngo Patent as applied to claims 1, 2, 8 to 11, 17 to 20, 26 to 31 and 32 to 34 above and further in view of the '566 Tao Patent under §103(a); for the above reasoning and further because: the prior art lack a suggestion that the reference should be modified in a manner required to meet the claims; the invention is contrary to the teaching of the Ngo Patent—that is, the invention goes against the grain of what the prior art teaches; the Examiner has made a strained interpretation of the references that

could be made only by hindsight; the Examiner has not presented a convincing line of reasoning as to why the claimed subject matter as a whole, including its differences over the prior art, would have been obvious; and the prior art references do not contain any suggestions (express or implied) that they be combined, or that they be combined in the manner suggested; the references take different approaches.

Claims 2 to 10 and 29 depend from independent claim 1; claims 12 to 19 and 30 depend from independent claim 11; claims 21 to 28 and 31 depend from independent claim 20; and are believed to distinguish over the combination for the reasons previously cited.

Therefore claims 1 to 34 are submitted to be allowable over the cited references and reconsideration and allowance are respectfully solicited.

CONCLUSION


In conclusion, reconsideration and withdrawal of the rejections are respectfully requested. Allowance of all claims is requested. Issuance of the application is requested.

It is requested that the Examiner telephone Stephen G. Stanton, Esq. (#35,690) at (610) 296 - 5194 or the undersigned attorney/George Saile, Esq. (#19,572) at

Docket:: TSMC 00 - 355
S/N: 09/765,044

(845) 452 – 5863 if the Examiner has any questions or issues that may be resolved to expedite prosecution and place this Application in condition for Allowance.

Respectively submitted,

A handwritten signature in black ink, appearing to be 'SBA', is written over a horizontal line.

Stephen B. Ackerman

Reg. No. 37,761